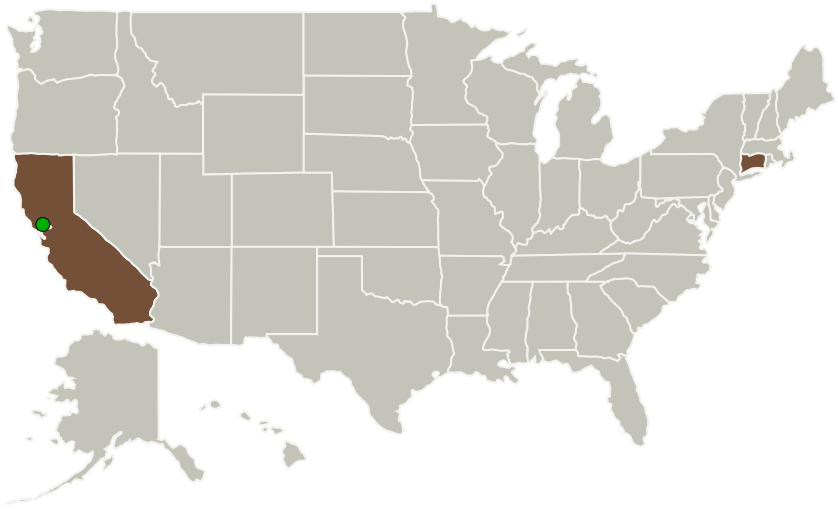
Laser Stethoscope for Use in Noisy Spacecraft Environments, Phase I

Completed Technology Project (2011 - 2011)

Project Introduction

Auscultation, or listening to internal sounds made by the body of a patient, is an important tool in medical diagnostics. Heart, lung, intestine, and circulatory function can be assessed through careful listening. There are numerous situations, however, where the faint sounds collected using an ordinary stethoscope are overwhelmed by ambient noise. Such is the case in spacecraft, where room is scarce and noise generating equipment is always nearby. Here, a stethoscope employing laser Doppler vibrometry is proposed. Through an innovative design employing adaptive filtering, the new-technology stethoscope will provide immunity to external noise while providing conventional auscultation sounds for easy interpretation by medical professionals. Phase I and Phase II development will result in a system that is lightweight, rugged, efficient, and compact, making it suitable for use in space. The system will provide enhanced medical care for astronauts in space, allowing auscultation sounds to be transmitted back to mission control medical personnel despite the high levels of ambient noise present in the spacecraft.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Advanced Fuel Research, Inc.	Lead Organization	Industry	East Hartford, Connecticut
Ames Research Center(ARC)	Supporting Organization	NASA Center	Moffett Field, California

Primary U.S. Work Locations	
California	Connecticut

Project Transitions

February 2011: Project Start

September 2011: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/138243)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Advanced Fuel Research, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

James J Scire

Co-Investigator:

James Scire

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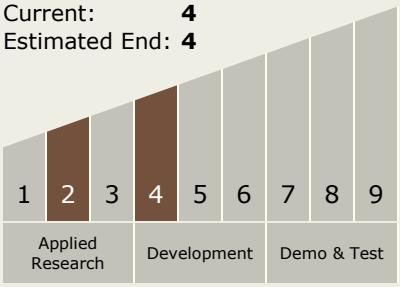
Technology Maturity (TRL)

Start: **2**
Current: **4**
Estimated End: **4**



Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
  - TX06.3 Human Health and Performance
    - TX06.3.1 Medical Diagnosis and Prognosis

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System